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THE FIBERS OF LONG-STAPLE UPLAND COTTONS.

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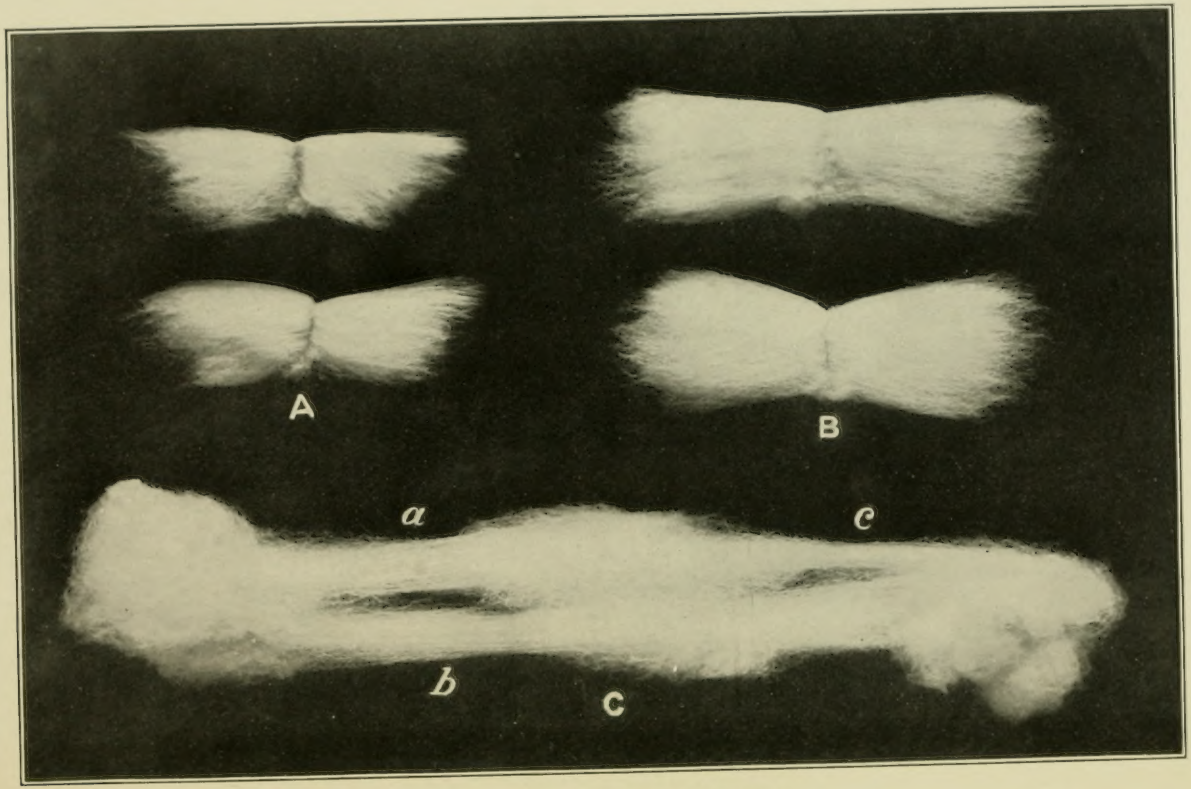
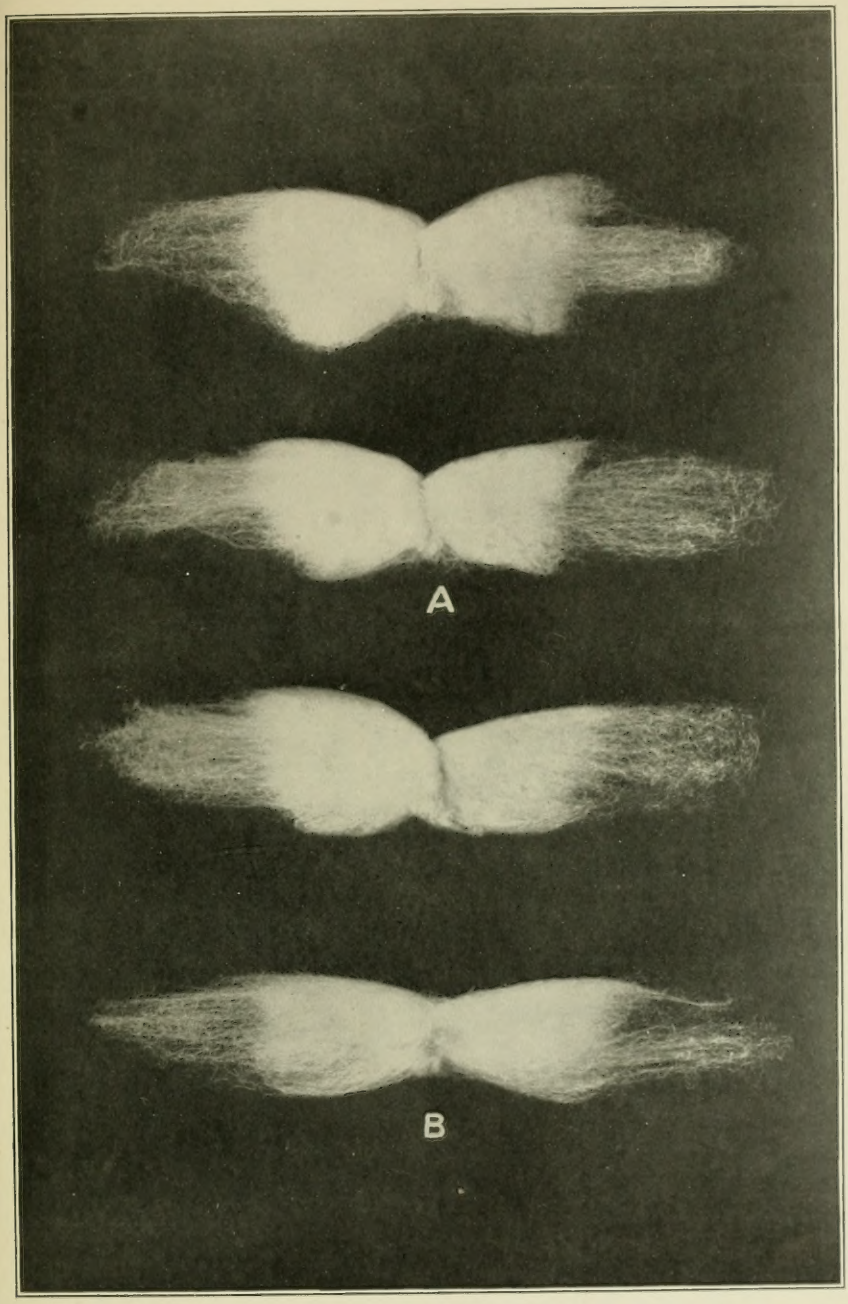


COTTON SEEDS WITH FIBERS ATTACHED.

A and *B*.—Cotton seeds with fibers combed out to show uniformity and nonuniformity in the length of the fibers. C.—Lock of Griffin cotton stretched so as to show points of origin of longer fibers—*a*, *b*, and *c*.



SEEDS OF COTTON COMBED OUT TO SHOW THE SO-CALLED LONGER FIBERS.

A.—Columbia variety. *B*.—Griffin variety.

THE FIBERS OF LONG-STAPLE UPLAND COTTONS.

UNIFORMITY OF COTTON FIBERS.

In investigations in cotton breeding where an improvement in certain lint characters is desired several factors must be carefully considered. Among these, some of the most important are fineness of lint, the relative yield of lint to the total yield of seed cotton, and the uniformity of length of all the fibers when properly combed out and examined. The last character, uniformity of length, is a most important one and has much to do with subsequent waste and the production of good yarns in the process of manufacture.

On Plate I are illustrations of cotton seeds with fibers combed out to show uniformity and nonuniformity in the length of the fibers. The seeds to the left (A) show very poor uniformity and are of the "butterfly" type, as they are commonly called. In marked contrast, the seeds to the right (B) show excellent uniformity as a result of several generations of careful selection.

APPARENT LACK OF UNIFORMITY AND ITS OCCURRENCE.

There is an apparent lack of uniformity which deserves considerable attention from the standpoint of cotton growers and breeders. Plate II illustrates this character, although it is more strikingly brought out in the operation of detaching the seed from the lock. From the illustration there would appear to be a great lack of uniformity, due to a group of fibers about twice the length of the general covering. This group arises from the center of the main body of fibers or, often, from those having a point of attachment near the larger end of the seed. This character is usually associated with the finer, more crinkly types of long-staple cottons, such as the fine, long-linted Egyptian and Sea Island varieties and the long-staple Upland varieties—Griffin, Allen, Cook, etc. It is a character which becomes more apparent as a variety is being rigidly selected generation after generation for finer, longer staple. This has been well illustrated in the improvement of the lint characters of the Russell variety and, to some extent, the Jones variety. The orginal condition

of both of these varieties is remarkably free from this so-called longer group of fibers. In the case of the greatly improved Russell strain, which has become distinctive enough in good lint characters and yield to be designated as a new variety—the so-called Columbia cotton—these longer fibers are evident to a remarkable degree.

THE TRUE NATURE OF THE LONGER FIBERS.

It has been more or less the rule with cotton breeders and cotton growers acquainted with the requisites of desirable lint characters to regard these extra-long fibers as an unfavorable feature. In this light they meant a variation toward nonuniformity. In the work of selection, to avoid as much as possible a perpetuation of this sort of variation, plants showing this character most markedly were regarded with suspicion and later even discarded, although in other respects they were among the best in the field.

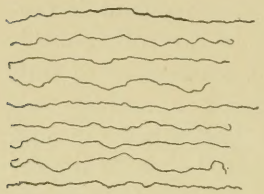


FIG. 1.—Single cotton fibers from the so-called longer group of fibers.

A careful examination leads to the conclusion that these fibers should be regarded in a wholly different light. *They are not longer fibers as they have been generally considered, but are caused by more or less curling and interweaving, which results in the pulling out of fibers from adjacent seeds.*

In the ordinary manner of stretching the locks to determine the drag, the fibers are slowly separated and drawn out, and at those points of greatest binding, as shown in Plate I, C, *a*, *b*, and *c*, the groups of longer fibers appear to rise. If, now, a single seed is selected and detached from the rest and the entire group of fibers loosened from its attachment to the seed coat in the neighborhood of the longer groups, one can with fine forceps draw these fibers out carefully and compare their length with those of the rest of the seed.

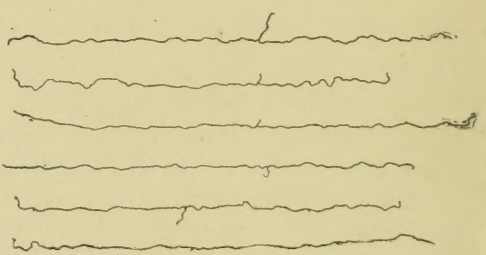


FIG. 2.—A few extra-long cotton fibers, showing two fibers united.

In many instances the single fibers now readily separate, since the tension of pulling has ceased. Several of these single fibers are shown in figure 1. In some instances fibers nearly twice the normal length are drawn out. Oftentimes with the naked eye the point of union or tying may be discerned by the tiny loose ends, as is shown in figure 2. In other cases, however, this point of union is so intimate that only a high microscopic power can make it evident. Figure 3 illustrates various

degrees of this tying or curling together, as seen when greatly magnified. In figures 1 and 2 single and united fibers, respectively, of natural length are shown, but the diameters are of necessity much greater than normal, owing to the exceeding fineness of the fibers.

The drag of cottons showing the longer fibers previously described gives a more extended, elastic tension than is manifest among the short-staple varieties. It is probable that breeders may find this character a useful one in indicating a tendency toward increased length, fineness, and crinkliness of staple in the individuals in which it occurs most noticeably—an indication of better spinning quality.

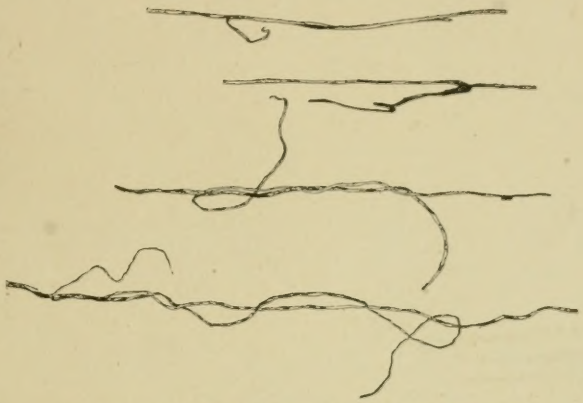


FIG. 3.—Cotton fibers tied together, very much magnified.

It is important that breeders and growers of long-staple cottons should know that these apparently longer fibers are no indication of true lack of uniformity. The presence of these fibers in the long-staple Upland varieties has quite universally led to the erroneous belief that such cottons are rather inferior in uniformity as regards length of fibers. The Griffin cotton, in particular, recognized in other respects as the best long-staple Upland cotton grown, has always been described as decidedly unsatisfactory so far as uniformity in length of staple is concerned, since the drawing out of fibers from adjacent seed is a marked characteristic of this variety.

A knowledge of the true nature of these longer fibers will clear the reputation of some of the best long-staple Upland varieties of a serious fault hitherto wrongly attributed to them by all breeders and growers.

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